

CLAIMS

WE CLAIM:

- 5 1. A stator for a rotating electrical machine, comprising:
 a stator core having an outer circumferential surface and an opening
therethrough that forms an inner circumferential surface;
 at least two longitudinal slots formed in the inner circumferential surface
of the stator core; and
10 at least one stator coil having a first slot-insertion segment and a second
slot-insertion segment interposed by a non-slot-insertion segment, the first and
second slot-insertion segments extending parallel to one another in a first plane
and inserted, one each, within a separate slot, the non-slot-insertion segment
having a first non-twisted segment and a second non-twisted segment interposed
15 by a twisted segment,
 wherein the twisted segment is twisted a predetermined number of degrees
and includes at least a portion thereof that is bent at a predetermined angle relative
to a second plane that is parallel to the first plane.
- 20 2. The stator of Claim 1, wherein the non-slot-insertion segment is
generally V-shaped and includes an apex at a predetermined position thereon.
3. The stator of Claim 2, wherein the apex is located on the twisted
segment.
- 25 4. The stator of Claim 1, wherein the non-slot-insertion segment
extends in a direction away from the first and second slot-insertion segments
generally toward the outer circumference of the stator core.

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5. The stator of Claim 1, wherein the predetermined number of degrees of the twist is approximately 180° .

5 6. The stator of Claim 1, wherein the predetermined angle of the bend is approximately 45° .

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7. A stator for a rotating electrical machine, comprising:
a stator core having an outer circumferential surface and an opening
therethrough that forms an inner circumferential surface;
at least two longitudinal slots formed in the inner circumferential surface
5 of the stator core; and

at least one stator coil having a first slot-insertion segment and a second
slot-insertion segment interposed by a generally V-shaped non-slot-insertion
segment, the first and second slot-insertion segments extending parallel to one
another in a first plane and inserted, one each, within a separate slot, the non-slot-
10 insertion segment having an apex formed thereon at a predetermined position,
wherein the apex is bent at a predetermined angle relative to a second
plane that is parallel to the first plane, and includes at least a portion thereof that is
twisted a predetermined number of degrees.

8. The stator of Claim 7, wherein the non-slot-insertion segment
15 includes a first non-twisted segment and a second non-twisted segment interposed
by the apex.

9. The stator of Claim 7, wherein the non-slot-insertion segment
20 extends in a direction away from the first and second slot-insertion segments
generally toward the outer circumference of the stator core.

10. The stator of Claim 7, wherein the predetermined number of
25 degrees of the twist is approximately 180°.

11. The stator of Claim 7, wherein the predetermined angle of the bend
is approximately 45°.

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12. A rotating electrical machine, comprising:

a rotationally mounted rotor; and

a stator surrounding the rotor, the stator including:

a stator core having an outer circumferential surface and an

5 opening therethrough that forms an inner circumferential surface,

at least two longitudinal slots formed in the inner circumferential surface of the stator core, and

at least one stator coil having a first slot-insertion segment and a second slot-insertion segment interposed by a non-slot-insertion segment, the first and second slot-insertion segments extending parallel to one another in a first plane and inserted, one each, within a separate slot, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment,

10 wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane.

13. The machine of Claim 12, wherein the non-slot-insertion segment is generally V-shaped and includes an apex at a predetermined position thereon.

14. The machine of Claim 13, wherein the apex is located on the twisted segment.

15. The machine of Claim 12, wherein the non-slot-insertion segment extends in a direction away from the first and second slot-insertion segments generally toward the outer circumference of the stator core.

16. The machine of Claim 12, wherein the predetermined number of degrees of the twist is approximately 180°.

17. The machine of Claim 12, wherein the predetermined angle of the bend is approximately 45°.

5 18. The machine of Claim 12, wherein the machine is configured as a generator.

19. The machine of Claim 12, wherein the machine is configured as a motor.

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20. A coil for insertion into a stator core, comprising:
a first slot-insertion segment extending in a first plane;
a second slot-insertion segment extending parallel to the first slot-insertion
segment in the first plane; and

5 a non-slot-insertion segment coupled to the first and second slot-insertion
segments together, the non-slot-insertion segment having a first non-twisted
segment and a second non-twisted segment interposed by a twisted segment,
wherein the twisted segment is twisted a predetermined number of degrees
and includes at least a portion thereof that is bent at a predetermined angle relative
10 to a second plane that is parallel to the first plane.

21. The coil of Claim 20, wherein the non-slot-insertion segment is
generally V-shaped and includes an apex at a predetermined position thereon.

15 22. The coil of Claim 21, wherein the apex is located on the twisted
segment.

23. The coil of Claim 20, wherein the non-slot-insertion segment
extends in a direction away from the first and second slot-insertion segments.

20 24. The coil of Claim 20, wherein the predetermined number of
degrees of the twist is approximately 180° .

25 25. The coil of Claim 20, wherein the predetermined angle of the bend
is approximately 45° .

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26. A method of assembling a stator core for a rotating electrical machine, the method comprising:

providing a stator core having an outer circumferential surface and an opening therethrough that forms an inner circumferential surface;

5 forming at least two longitudinal slots in the inner circumferential surface of the stator core;

providing at least one stator coil having:

a first slot-insertion segment extending in a first plane,

10 a second slot-insertion segment extending parallel to the first slot-insertion segment in the first plane, and

a non-slot-insertion segment coupled to the first and second slot-insertion segments together, the non-slot-insertion segment having a first non-twisted segment and a second non-twisted segment interposed by a twisted segment, wherein the twisted segment is twisted a predetermined number of degrees and includes at least a portion thereof that is bent at a predetermined angle relative to a second plane that is parallel to the first plane; and

15 inserting the first and second slot-insertion segments, one each, within a separate slot.

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